Phytoplankton What Does It Need to Thrive?

Directions: As you read through the resources on phytoplankton, note information in the appropriate category below.

category below.
What are phytoplankton? Where can you find phytoplankton? In what part of the water column do plankton thrive? Why?
What do phytoplankton require for growth? What nutrients does phytoplankton need to stay alive?
Where do those nutrients come from? What is photosynthesis and what does it have to do with plankton? What is meant by the term phytoplankton bloom ?
Why do phytoplankton generally bloom in the spring, with occasional secondary blooms in the fall?
Where do phytoplankton belong in most aquatic food chains?
Do phytoplankton swim?

Answers to Phytoplankton What Does It Need to Thrive?

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What are phytoplankton? *Microscopic plants*

Where can you find phytoplankton? In what part of the water column do plankton thrive? Why? Phytoplankton live in oceans, seas or lakes. Phytoplankton live at the top of the water column, as far down as the sunlight can penetrate. This is called the euphotic zone.

What do phytoplankton require for growth? Sunlight and nutrients

What is photosynthesis and what does it have to do with plankton? *Phytoplankton use sunlight, carbon dioxide* (CO₂) and water, in a process called photosynthesis, to produce organic compounds which they use for food and to make their cells. The waste product of photosynthesis is oxygen.

What nutrients does phytoplankton need to stay alive? Where do those nutrients come from? Phytoplankton need carbon dioxide, iron, nitrogen and phosphorous in order to photosynthesize. Gases dissolving into the water column are one source of nutrients. Another source is runoff from fresh water streams, snowmelt and melting glacial ice. Finally, precipitation brings nutrients to the water column.

What is meant by the term **phytoplankton bloom**? Phytoplankton only live for a day, maybe two if they are really old. They multiply so fast that they split into two pieces. They go from one million to two million in seconds. This rapid growth is called a bloom.

Why do phytoplankton generally bloom in the spring, with occasional secondary blooms in the fall?

- In the spring, the sun heats the surface waters of the ocean making them less dense. It also stratifies the water column so the phytoplankton stay at the top. At this time of year nutrients, mixed into the surface layer in the winter, are plentiful for the "hungry" phytoplankton.
- In the summer, the stratified waters keep most new nutrients from reaching the euphotic zone. As a result, the phytoplankton use the available nutrients and then die off.
- In the fall, surface waters cool down and their density increases. The smaller density allows some limited mixing between the surface and deeper waters. The influx of new nutrients may be enough for a second bloom.
- As the surface water continues to cool, more deep water mixing takes place. However, the hours of the winter sun are not enough for photosynthesis to occur.

Where do phytoplankton belong in most aquatic food chains? *At the bottom; phytoplankton are primary producers.*

Do phytoplankton swim? No, they drift in the water column pushed by currents, tides and even wind. However, one type of phytoplankton, the dinoflagellates, seems to be able to propel itself through the water using its **flagellates**.